

Agreement Number H4525020034

COOPERATIVE AGREEMENT
between
THE UNITED STATES DEPARTMENT OF INTERIOR
NATIONAL PARK SERVICE
and
THE NATURE CONSERVANCY - NEW YORK NATURAL HERITAGE PROGRAM

*****Beginning Date: Date of Execution Completion Date: October 31, 2004

Fiscal Year 2002

Funding: \$84,418

Account Numbers: 2110-COAS-NII (\$42,209) and 2111-NII (\$42,209)

Budget Class: 412A

Contracting Officer's Representative: Elizabeth Johnson

Project Title: Vegetation Sampling, Classification, and Mapping of Selected

*09/03
This copy has
original signatures
Mary Foley has not
signed*

This Cooperative Agreement is entered into by and between The Nature Conservancy, (hereinafter also known as the Cooperator) and the United States National Park Service (hereinafter also known as the Service).

ARTICLE I - BACKGROUND AND OBJECTIVES

The Nature Conservancy-New York Natural Heritage Program is a 501 (c) 3 nonprofit organization.

{PRIVATE}The Nature Conservancy-New York Natural Heritage Program enables and enhances conservation of New York's rare animals, rare plants, and significant ecosystems. The Program is an ongoing scientific inventory whose goal is to compile and maintain systematic information on New York State's native rare plants and animals and significant ecological communities. Combined with thorough field inventories, scientific analyses, expert interpretation, and the most comprehensive database on New York's distinctive biodiversity The Nature Conservancy-New York Natural Heritage Program delivers the highest quality information for natural resources planning, protection, and management in the state.

The Nature Conservancy-New York Natural Heritage Program is intimately familiar with the sampling methods and vegetation mapping standards developed for the National Vegetation Classification by the U.S. Geological Survey and adopted by the National Park Service. They were key partners in the recently completed Fire Island National Seashore Vegetation Mapping Project (Klopfer 2001). The Fire Island project made it clear that it would be more cost-effective for all products and expertise for all phases of the project be the responsibility of one partner. In addition to their work on the Fire Island vegetation mapping project, NY Natural Heritage has nearly completed intensive biological inventories of all of New York's State Parks.

The Service and the Cooperator mutually desire to cooperate in executing this Cooperative Agreement (hereinafter also known as the Agreement) to map the existing vegetation at four National Park units in New York state; Gateway National Recreation Area (GATE), Sagamore Hill National Historic Site (SAHI); Roosevelt-Vanderbilt National Historic Site (ROVA), and Saratoga National Historical Park (SARA).

ARTICLE II - AUTHORITY

The Act of August 25, 1916, as amended, 16 U.S.C. § 1, 2-4 (1988), declares that the Service will promote and regulate the use of the various federal areas known as units of the national park system by such means and measures as conform to the fundamental purpose of the national park system, which purpose is to conserve the scenery and natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

16 U.S.C. § 1g provides broad authority for the National Park Service to, in fiscal year 1997 and thereafter, enter into Cooperative Agreements that involve the transfer of National Park Service appropriated funds to state, local, and tribal governments, other public entities, educational institutions, and private non-profit organizations for the public purpose of carrying out National Park Service programs pursuant to *Section 6305 of Title 31* to carry out public purposes of National Park Service programs.

16 U.S.C. § 1a-2(j) authorizes the Secretary of the Interior, in order to facilitate the administration of the national park system, to carry out the following activity under such terms and conditions as he may deem advisable: "Enter into Cooperative Agreements with public or private educational institutions, States, and their political subdivisions, for the purpose of developing adequate coordinated, cooperative research and training programs concerning the resources of the national park system, and, pursuant to any such agreements, to accept from and make available to the Cooperator such technical and support staff, financial assistance for mutually agreed upon research projects, supplies and equipment, facilities, and administrative services relating to cooperative research units as the Secretary deems appropriate; except that this paragraph shall not waive any requirements for research projects that are subject to the *Federal procurement regulations*."

ARTICLE III - STATEMENT OF WORK

NOW, THEREFORE, in consideration of the foregoing as a basis for agreement, cooperation and assistance between the parties and to achieve their compatible objectives, the parties agree as follows:
perform the functions specified below in accordance with the provisions of this agreement.

Determine and map the plant communities within selected lands administered by the National Park Service in New York to enable and enhance future inventories, monitoring, and management of the natural resources found within these areas. The following National Park Service sites will be assessed through this project: Gateway National Recreation Area; Sagamore Hill National Historic Site; Roosevelt-Vanderbilt National Historical Park (which includes the following units: Vanderbilt Mansion, Eleanor Roosevelt, and Home of Franklin D. Roosevelt National Historic Sites); and Saratoga National Historical Park.

A. The Cooperator agrees to:

1. Conduct site reconnaissance visits and meet with Service staff.

- NY Natural Heritage will meet with Service staff from each National Park Service site to explain the project's scope and purpose, to learn security requirements and access logistics, and to gather available site information.
- Reconnaissance tours of each site will be undertaken to familiarize our staff with broad ecological patterns and to determine field survey logistics.

2. Compile and assess background data to make preliminary predictions of natural community polygons and National Vegetation Classification associations.

- Existing unprocessed information in NY Natural Heritage files will be reviewed and entered into the NY Natural Heritage database for all National Park Service properties in New York. Information on leads for significant natural community occurrences will be reviewed and prioritized for inventory. This information will help us ensure that rare natural community types (which may or may not have distinctive photo signatures) are captured and that exemplary occurrences of common types are highlighted.
- Digital ortho-corrected aerial photos supplied by the National Park Service will be assessed to make preliminary identifications of natural community polygons and National Vegetation Classification associations at each National Park Service site. Available data layers in digital and hard copy formats will be

reviewed to refine these predictions: soil maps (USDA Soil Conservation Service County Soil Surveys; NY State Soil Survey Geographic Database), bedrock and surficial geology maps (NY State Geological Survey maps and digital data), wetland maps (National Wetlands Inventory Data for NY State; NY State Regulatory Freshwater Wetland data), the NY Natural Heritage database, 1995 NAAP CIR aerial photos, and 1994-99 digital ortho-corrected quarter-quadrangles (DOQQ). Other data layers will be reviewed depending on availability and applicability to the study area, such as tidal wetland maps (NY Department of State, Division of Coastal Resources) and The Nature Conservancy's ecological landscape units.

3. **Develop preliminary digital maps of National Vegetation Classification associations.**
 - Preliminary vegetation maps will be produced by first delineating preliminary polygons on aerial photos supplied by the National Park Service and color infrared National Aerial Photography Program photos using a stereoscope and mylar overlays. Minimum vegetation mapping units will be 0.5 ha, except for unique vegetation types that occur only in small patches (fens, vernal pools, etc.).
 - The mylar overlays will be screen digitized in ArcView using digital ortho-corrected aerial photos supplied by the National Park Service to generate preliminary digital maps of National Vegetation Classification associations at each National Park Service site. The screen digitizing process will allow the simultaneous use of aerial photography and supplemental digital data layers that are useful in delineating National Vegetation Classification association boundaries, including USGS quadrangle maps, Department of Transportation road coverages, hydrology coverages, and National Park Service boundaries. All polygons will be attributed with a code at the time of digitizing.
 - Preliminary vegetation maps will be made for both National Park Service sites and for surrounding areas defined by the National Park Service (Nigel Shaw, pers. comm. May 1 & 2, 2002).
4. **Produce draft vegetation classifications for each site (combining sites where appropriate).**
 - NY Natural Heritage will produce a draft classification of National Vegetation Classification associations predicted to be at each National Park Service site.
 - A draft subset of the New York ecological communities predicted at each National Park Service site will also be produced using the current NY Natural Heritage classification (Edinger *et al.* 2002). Potentially significant ecological communities will be highlighted.
5. **Collect plot and observation point data to confirm or correct identification and delineation of National Vegetation Classification associations and significant ecological communities at each site.**
 - Field methods will be consistent with USGS/NPS Vegetation Mapping Program standards. All plot and observation point data will be used to ensure accurate identification and delineation of community occurrences. Plots and observation points will be recorded using GPS.
 - Plots will be sampled following established standards adopted by NY Natural Heritage, the international network of Natural Heritage Programs, and the USGS/NPS Vegetation Mapping Program (Edinger *et al.* 2000, Grossman *et al.* 1998, Sneddon 1994). Plot size will be determined by physiognomic type as follows: forests 200-500 m² (e.g., 20 m x 20 m), shrubland 50-200 m², grassland 50-100 m², dwarf-shrub heath 10-25 m² (Mueller-Dombois and Ellenburg 1974). Minimally, one plot will be sampled for all natural community occurrences determined to be significant by NY Natural Heritage. Plots will also be sampled in cases where type classification is problematic. Sampled plots will include exhaustive data on plant species composition and structure for all vegetative strata; sampling and noting important soil properties observed within the community; and recording detailed information on surficial and bedrock geology, slope, aspect, elevation, and hydrologic regimes for the area.
 - Extensive observation point data will be collected to verify the identity and spatial extent of all associations present at each site. Observation points include data on dominant plant species composition and structure for all vegetative strata. Additional data will be collected as needed to classify the association accurately (e.g., soil type, hydrology, pH, etc.).
 - For significant occurrences, information on the maturity of the occurrence, anthropogenic and natural disturbances influencing the community, and the condition of the surrounding landscape will also be recorded. Combined with the detailed information on the biological and physical properties of the community, data documenting landscape condition will allow a complete assessment of the ecological quality of the community occurrence. The collection of a consistent set of data on each community allows quick and accurate comparisons between communities of the same type, which ultimately determines the overall quality rank of the occurrence.
6. **Enter data into the NY Natural Heritage Field Forms Database and Biological and Conservation Data System.**
 - Plot data will be entered into the NY Natural Heritage Field Forms Database, a database system on a Microsoft Access platform that greatly speeds the preparation of site forms and can easily be transferred into

the USGS/NPS Vegetation Mapping Program Plots Database (1997). Species will be assigned standardized codes and names based on the PLANTS database (developed by National Resources Conservation Service in cooperation with the Biota of North America Program).

- Information on significant natural communities will be incorporated into the NY Natural Heritage Biological and Conservation Data System. This data will become part of the NY Natural Heritage database, and as such will be available for national assessments by the National Park Service in collaboration with NatureServe, and for local assessments by Service land managers and planners.
7. **Perform statistical analyses of plot data as needed to ensure accurate classification of types encountered.**
 - Species and plot data will be formatted into an Excel spreadsheet for use in the PC-ORD version 4.0 Multivariate Analysis package (McCune and Mefford 1999). Statistical analyses will help clarify classification issues, and may utilize Detrended Correspondence Analysis (Hill and Gauch 1980), Two-Way Indicator Species Analysis (Hill 1979), and Non-metric Multidimensional Scaling (Kruskal and Wish 1978, Clarke 1993). Detrended Correspondence Analysis ordines both species and samples simultaneously along perceived gradients (e.g., that may indicate moisture gradient, elevation, etc.). Two-Way Indicator Species Analysis successively divides the plots into groups that are similar in species composition. Non-metric Multidimensional Scaling is an ordination well suited to non-heterogenous, non-normal data sets.
 8. **Produce final classifications for each site (combining sites where appropriate).**
 - NY Natural Heritage will refine the draft classification of National Vegetation Classification associations at each National Park Service site based on field assessments and statistical analyses.
 - A refined subset of the New York ecological communities predicted at each National Park Service site will also be produced using the current NY Natural Heritage classification (Edinger *et al.* 2002). Significant ecological communities will be highlighted.
 9. **Produce final vegetation maps for each site (combining sites where appropriate).**
 - The preliminary draft vegetation maps will be finalized based on field assessments and statistical analyses. When significant natural community polygons extend beyond National Park Service property boundaries, NY Natural Heritage will use aerial photo interpretation to digitize each occurrence's full extent.
 - The attribute table for each polygon will then be automatically populated with area (m²), perimeter (m), and total acres data using an ArcView script. As a final step, the ArcView shapefile will be converted to an ArcInfo polygon coverage through the use of the SHAPEARC and REGIONPOLY commands in ArcInfo. The final digital product for each National Park Service site will include a shapefile, an ArcInfo polygon coverage, and a DBF file containing information on each National Vegetation Classification association.
 10. **Conduct accuracy assessment of vegetation maps**
 - After the final vegetation map has been completed, NY Natural Heritage will carry out an assessment of class and positional accuracy across each National Park Service site. We will first develop a random sampling scheme for accuracy assessment observation points, stratified by polygon/vegetation type. The number of required accuracy assessment sampling points will be based on USGS/NPS Vegetation Mapping Program protocols. We will then survey accuracy assessment observation points to determine the association and natural community type present. Results of the accuracy assessment may be used to make minor corrections to the final vegetation maps.
 11. **Complete final project report.**
 - NY Natural Heritage will deliver final reports on each National Park Service site (or combination of sites) that includes: concise methods summary; lists and descriptions of National Vegetation Classification associations and NY Natural Heritage ecological community types; and site descriptions of significant natural communities. Paper maps of National Vegetation Classification associations and significant ecological communities will be included as appendices. All polygons, attribute tables, and metadata will be delivered on CD in ArcView 3.2 format or other ArcInfo format acceptable to the Service and in a projection compatible for Service needs, as will vegetation data entered into the USGS/NPS Vegetation Mapping Program Plots Database. GPS locations of all sample plots and observation points, including accuracy assessment points, will be provided as part of the attribute files. Field plot data will be provided in the into USGS/NPS Vegetation Mapping Program Plots Database.
 - All digital geospatial data developed for this project will have Federal Geographic Data Committee (FGDC) compliant metadata in digital form. The metadata will be parsed using the metadata parser provided by the FGDC (<http://www.fgdc.gov>) or the FGDC Metadata Editor in ESRI ArcGIS software. The metadata will be supplied as ASCII text with a .txt extension, hypertext markup language with a .html extension, and standard general markup language with a .sgml extension.

- Data collected during this study will also be integrated into the NY Natural Heritage database, and may be used in the future to refine the National Vegetation Classification and the New York ecological community classification.

B. The Service agrees to:

1. provide the cooperator with digital ortho-corrected aerial photographs of the four Northeast Region parks;
2. provide the cooperator with ArcView shapefiles of park boundaries for each of the parks as well as a boundary that falls outside of park boundaries that will be included in this mapping project.
3. provide NPS vehicle access to remote portions of the parks for field work as road conditions allow, subject to the determination of the Superintendent. Permission to use New York State vehicles or Nature Conservancy staff vehicles on parks roads in order to accomplish the objectives of this project may be granted as road conditions allow.
4. provide NPS personnel time, as available, to assist with field data collection and to familiarize Cooperator staff with Park resources and locations;
5. provide NPS personnel time to evaluate work in progress, consult with the Cooperator, and assist with project development.
6. provide temporary housing, as available, for Cooperator staff during Park visits;
7. issue research and scientific collection permits for each park if the proposed work meets NPS and park policies and guidelines;
8. provide any maps, reports, photography, and databases from the parks containing information relevant to this project; and
9. make available \$84,418 to the Cooperator to carry out the terms of this Agreement. Based upon the availability of funding and satisfactory project progress. Additional funding may be obligated to the Agreement by additional amendments and upon approval of associated research and budget proposals.

C. The Service and Cooperator jointly agree to:

1. meet periodically to coordinate activities and track progress and expenditures of the project.

ARTICLE IV - TERMS OF AGREEMENT

The agreement will become effective upon signature of both parties and extend through October 31, 2004.

ARTICLE V- KEY OFFICIALS

The key officials specified below in this agreement are considered to be essential to ensure maximum coordination and communication between the parties and the work being performed. Upon written notice, either party may designate an alternate to act in place of the designated key official, in an emergency or otherwise.

A. **For the National Park Service:**

1. **Local/Coordinating**

Elizabeth Johnson
Regional Inventory and Monitoring Program Coordinator
University of Rhode Island

105 Coastal Institute in Kingston
 Kingston, RI 02881
 email: beth_johnson@nps.gov
 Phone: (401) 874-7060
 Fax: (401) 874-4561

B. For the Cooperator:

David VanLuven
 Director, The Nature Conservancy-New York Natural Heritage Program
 625 Broadway, 5th Floor
 Albany, NY 12233-4757
 email: devanluv@gw.dec.state.ny.us
 Phone: (514)402-8948
 Fax: (518)402-8925

ARTICLE VI – AWARD AND PAYMENT

To accomplish the work described in Article III above the NPS hereby obligates a total \$84,418 from Fiscal Year 2002 funds held in Account #'s 2110-COAS-NII and 2111-NII.

The Cooperator shall be reimbursed for indirect costs at the negotiated rate of 22% of Modified Total Direct Costs for each Task Agreement. The Cooperator will contribute the balance of its standard indirect cost rate as services-in-kind support to each individual Task Agreement.

Payments/Invoices

- (1) This is a fixed-price Agreement. Request for Reimbursement and Advance of Funds (SF-270) shall be submitted to the NPS Contracting Officer. Invoices shall be submitted according to the schedule below and payment shall be made by electronic fund transfer.

December 31, 2002	\$27,418
June 30, 2003	\$19,000
December 31, 2003	\$19,000
June 30, 2004	\$19,000

ARTICLE VII – PRIOR APPROVAL

Not applicable.

ARTICLE VIII – REPORTS AND/OR DELIVERABLES

- A. Specific projects or activities for which funds are advanced will be tracked and reported by submittal of Standard Form 272, Federal Transaction Report, and yearly submittal of Standard Form 269, Financial Status Report, as outlined in 43 *CFR* § 12.952.
- B. The Cooperator shall provide the following deliverable items, following the delivery schedule defined as follows:

Reports

1. Preliminary digital maps and draft classifications for each National Park Service site shall be submitted on or before December 31, 2002. (Note: The date for this deliverable may be changed depending on when digital aerial photos are delivered to NY Natural Heritage by the National Park Service);

2. progress report on field survey results shall be submitted on or before June 30, 2003;
3. progress report on significant natural communities and results of statistical analysis of plot data shall be submitted on or before December 31, 2003;
4. final reports for each of the four National Park Service sites shall be submitted on or before June 30, 2004.

Final reports for each National Park Service site (or combination of sites) will include:

- concise methods summary;
- lists and descriptions of National Vegetation Classification associations and NY Natural Heritage ecological community types;
- site descriptions of significant natural communities;
- and paper maps of National Vegetation Classification associations and significant ecological communities.

Spatial data formats and deliverables will include:

- All polygons, attribute tables, and metadata delivered on CD in ArcView 3.2 format or other ArcInfo format acceptable to the Service and in a projection compatible for Service needs, as will vegetation data entered into the USGS/NPS Vegetation Mapping Program Plots Database.
- GPS locations of all sample plots and observation points, including accuracy assessment points, will be provided as part of the attribute files.
- Field plot data will be provided in a digital format suitable for transfer into the USGS/NPS Vegetation Mapping Program Plots Database.
- All digital geospatial data developed for this project will have Federal Geographic Data Committee (FGDC) compliant metadata in digital form. The metadata will be parsed using the metadata parser provided by the FGDC (<http://www.fgdc.gov>) or the FGDC Metadata Editor in ESRI ArcGIS software. The metadata will be supplied as ASCII text with a .txt extension, hypertext markup language with a .html extension, and standard general markup language with a .sgml extension.

- A. The Secretary of the Interior and Comptroller General of the United States, or their duly authorized representatives, shall have access for the purpose of financial or programmatic review and examination to any books, documents, papers, and records that are pertinent to the agreement at all reasonable times during the period of retention in accordance with 43 CFR § Part 12, Subpart F.

ARTICLE IX - PROPERTY UTILIZATION AND DISPOSITION

- A. The Nature Conservancy-New York Natural Heritage Program shall utilize, manage and dispose of any property that may be funded by this agreement as specified in 43 CFR § 12.934 and 12.935.
- B. The Cooperator will purchase a computer to be used primarily for this project.

ARTICLE X - MODIFICATION AND TERMINATION

- A. This agreement may be modified only by a written instrument executed by both parties.
- B. Either party may terminate this agreement by providing the other party with 60 days advance written notice. In the event that one party provides the other party with notice of its intention to terminate, the parties shall meet promptly to discuss the reasons for the notice and to try to resolve their differences amicably. The parties commit to using every reasonable means available, including the use of a neutral mediator if necessary, to avoid terminating this agreement.

ARTICLE X - GENERAL AND SPECIAL PROVISIONS

A. General Provisions

1. OMB Circulars and other Regulations – The following OMB Circulars and other regulations are incorporated by reference into this agreement:

" ARTICLE X - GENERAL AND SPECIAL PROVISIONS

A. General Provisions

1. OMB Circulars and other Regulations – The following *OMB Circulars* and other regulations are incorporated by reference into this agreement:
 - (a) OMB Circular A-110, as codified by 43 *CFR* Part 12, Subpart F, "Uniform Administrative Requirements for Grants and Agreements with Institutions of Higher Education, Hospitals, and other Non-Profit Organizations".
 - (b) OMB Circular A-122, "Cost Principles for Non-Profit Organizations".
 - (c) OMB Circular A-133, "Audits of State, Local Governments and Non-Profit Organizations".
 - (d) 43 *CFR* Part 12, Subpart D, "Governmentwide Debarment and Suspension (Nonprocurement) and Governmentwide Requirements for Drug-Free Workplace (Grants).
 - (e) 43 *CFR* Part 12, Subpart E, "Buy American Requirements for Assistance Programs".
 - (f) FAR Clause 52.203-12, Paragraphs (a) and (b) "Limitations on Payments to Influence Certain Federal Transactions".
2. **Non-discrimination** - All activities pursuant this agreement shall be in compliance with the requirements of Executive Order 11246; Title VI of the Civil Rights Act of 1964 (78 Stat. 252; 42 *U.S.C.* § 2000d *et seq.*); Title V, Section 504 of the Rehabilitation Act of 1973 (87 Stat. 394; 29 *USC* Section §794); the Age Discrimination Act of 1975 (89 Stat. 728; 42 *USC* §6101 *et seq.*); and with all other Federal laws and regulations prohibiting discrimination on the grounds of race, color, national origin, handicap, religious or sex in providing for facilities and service to the public.
3. **Lobbying Prohibition** - 18 *U.S.C.* §1913, Lobbying with Appropriated Moneys - No part of the money appropriated by any enactment of Congress shall, in the absence of express authorization by the Congress, be used directly or indirectly to pay for any personal service, advertisement, telegram, telephone, letter, printed or written matter, or other device, intended or designed to influence in any manner a Member of Congress, to favor or oppose, by vote or otherwise, legislation or appropriation by Congress, whether before or after the introduction of any bill or resolution proposing such legislation or appropriation; but this shall not prevent officers of employees of the United States or of its departments or agencies from communicating to Members of Congress on the request of any Member or to Congress, through the proper channels, requests for legislation or appropriations which they deem necessary for the efficient conduct of the public business.
4. **Anti-Deficiency Act** – 31 *U.S.C.* § 1341- Nothing contained in this agreement shall be construed as binding the NPS to expend in any one fiscal year any sum in excess of appropriations made by Congress, for the purposes of this agreement for that fiscal year, or other obligations for the further expenditure of money in excess of such appropriations.
5. **Minority Business Enterprise Development** – Executive Order 12432 – It is national policy to award a fair share of contracts to small and minority firms. The NPS is strongly committed to the objectives of this policy

and encourages all recipients of its cooperative agreements to take affirmative steps to ensure such fairness by ensuring procurement procedures are carried out in accordance with 43 CFR § 12.944 for Institutions of Higher Education, Hospitals and Other Non-Profit Organizations, and 43 CFR § 12.76 for State and Local Governments.

6. **Liability** – The Cooperator shall be fully responsible for by the acts or omissions of representatives, employees, contractors and subcontractors connected with the performance of this agreement. The Cooperator, in furtherance of and as an expense of this agreement shall:
- (a) Procure public and employee liability insurance from a responsible company or companies with a minimum limitation of one million dollars (\$1,000,000) per person for any one claim, and an aggregate limitation of three million dollars (\$3,000,000) for any number of claims arising from any one incident. The policies shall name the United States as an additional insured, shall specify that the insured shall have no right of subrogation against the United States for payments of any premiums or deductibles due thereunder, and shall specify that the insurance shall be assumed by, be for the account of, and be at the insured's sole risk. Prior to beginning the work authorized herein, the contractor shall provide the NPS with confirmation of such insurance coverage; and
 - (b) Pay the United States the full value for all damages to the lands or other property of the United States caused by such persons or organizations, its representatives, or other employees; and
 - (c) Indemnify, save and hold harmless, and defend the United States against all fines, claims, damages, losses, judgements, and expenses arising out of, or from any omission or activity of such person organization, its representatives, or employees.

B. **Special Provisions**

1. **Public Information**

- (a) The Cooperator shall not publicize, or otherwise circulate, promotional material (such as advertisements, sales brochures, press releases, speeches, still and motion pictures, articles, manuscripts or other publications) which states or implies governmental, departmental, bureau, or government employee endorsement of a product, service, or position which the Cooperator represents. No release of information relating to this award may state or imply that the Government approves of the Cooperator's work product s, or considers the Cooperator's work product to be superior to other products or services.
- (b) The Cooperator will ensure that all information submitted for publication or other public releases of information regarding this project shall carry the following disclaimer:

The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Government. Mention of trade names or commercial products does not constitute their endorsement by the U.S. Government.
- (c) The Cooperator must obtain prior NPS approval from the regional Public Affairs Office before releasing for any public information which refer to the Department of the Interior, any bureau or employee (by name or title) to this agreement. The specific text, layout, photographs, etc., of the proposed release must be submitted to the Public Affairs Office along with the request for approval.
- (d) The Cooperator further agrees to include this provision in a subaward to any subrecipient, except for a subaward to a State government, a local government, or a federally- recognized tribal government.

2. **Publications of results of studies**

No party shall unilaterally publish a joint publication without consulting the other party. This restriction does not apply to popular publication of previously published technical matter. Publications pursuant to this agreement may be produced independently or in collaboration with others, however, in all cases proper credit will be given to the efforts of those parties contributing to the publication. In the event no Agreement is reached concerning the manner of publication or

proposed manuscripts to the other. In such instances, the party publishing the data will give due credit to the cooperation but assume full responsibility for any statements on which there is a difference of opinion.

- C. Certifications – The following forms(s) provide the certifications required in accordance with the provisions of this agreement:

1. DI-2010

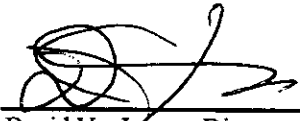
ARTICLE XII — ATTACHMENTS

The following documents are attached to and made a part of this agreement:

- A. The Cooperator's Work Plan and Budget
- B. Standard Form 424, Application for Federal Assistance
- C. Standard Form 424A, Budget Information.

ARTICLE XIII – SIGNATURES

IN WITNESS WHEREOF, the parties hereto executed this agreement on the date(s) set forth below.

**FOR THE NATURE CONSERVANCY-NEW
YORK NATURAL HERITAGE PROGRAM**

David VanLaven, Director, The Nature Conservancy-
New York Natural Heritage Program,
devanluv@gw.dec.state.ny.us

September 19, 2002

Date

FOR THE NATIONAL PARK SERVICE

Mary Foley, Chief Scientist
Boston Support Office

Date



Susan D. Kurtz, Contracting Officer
NPS, Philadelphia Support Office

Date

9/20/02



New York Natural Heritage Program

A Partnership between The Nature Conservancy and the NYS Department of Environmental Conservation

625 Broadway, 5th Floor Albany, NY 12233-4757 (518) 402-8935 Fax (518) 402-8925 www.nynhp.org

Vegetation Sampling, Classification, and Mapping of Selected National Park Service Lands in New York

Proposal and Scope of Work

June 13, 2002

OBJECTIVE

Determine and map the plant communities within selected lands administered by the National Park Service in New York to enable and enhance future inventories, monitoring, and management of the natural resources found within these areas. The Nature Conservancy-New York Natural Heritage Program will utilize recent aerial photos and digital imagery to locate, identify, and map the plant communities of these areas, gather and analyze plant community data to develop a community classification for each of these areas, create maps of the plant communities present, provide attribute data (including plant species, cover, soil types, etc.) of the plant communities present, and assess the accuracy of the original mapping using Accuracy Assessment Protocols and refining the maps as necessary. The following National Park Service sites will be assessed through this project: Gateway National Recreation Area; Sagamore Hill National Historic Site; Vanderbilt Mansion, Eleanor Roosevelt, and Home of Franklin D. Roosevelt National Historic Sites; and Saratoga National Historical Park.

PROJECT NEED

In order for the National Park Service (Service) to manage, conserve, and monitor the species and communities within its properties, Service personnel must know which communities are present and their locations. This information will help direct resources for the inventory, protection, restoration, and management of the species and communities most in need. Service personnel must be able to make informed management decisions based on the status and trends of these communities using baseline data collected through inventory and continued through monitoring. To be used effectively, these data should be brought together in easily used maps and in databases that can be readily applied to analysis and interpretation. The National Vegetation Classification – a system developed by The Nature Conservancy, NatureServe, and Natural Heritage Programs throughout the United States – is the mapping standard selected by the Service. The Nature Conservancy-New York Natural Heritage Program will follow sampling methods and mapping standards consistent with guidelines developed by The Nature Conservancy for the USGS/NPS Vegetation Mapping Program. Any variation from guidelines due to time, budget, or other constraints will be documented. The Service (Chris Lea, pers. comm.) has identified the following National Park Service properties as requiring vegetation mapping: Gateway National Recreation Area; Sagamore Hill National Historic Site; Vanderbilt Mansion, Eleanor Roosevelt, and Home of Franklin D. Roosevelt National Historic Sites; and Saratoga National Historical Park. The sizes of these properties range from 26,610 acres at the Gateway National Recreation Area (20,444 acres federal, 6,166 acres non-federal) in both New York and New Jersey, to 83 acres (all federal) at the Sagamore Hill National Historic Site.

BACKGROUND

The Nature Conservancy-New York Natural Heritage Program is a partnership between the NYS Department of Environmental Conservation (NYS DEC) and The Nature Conservancy based in the NYS Division of Fish, Wildlife, and Marine Resources. Our mission is to enable and enhance conservation of rare animals, rare plants, and significant ecosystems. We accomplish this mission by combining thorough field inventories, scientific analyses, expert interpretation, and the most comprehensive database on New York's distinctive biodiversity to deliver the highest quality information for natural resource planning, protection, and management.

NY Natural Heritage was established in 1985 and is a contract unit housed within NYS DEC's Division of Fish, Wildlife, & Marine Resources. The program is staffed by more than 20 scientists and assistants with expertise in ecology, zoology, botany, information management, and geographic information systems.

NY Natural Heritage maintains New York's most comprehensive database on the status and location of rare species and natural communities. We presently monitor the status of 166 natural community types, 755 rare plant species, and 417 rare animal species across New York, keeping track of more than 10,000 locations where these species and communities are found. The database also includes detailed information on the relative rareness of each species and community, the quality of their occurrences, and descriptions of sites. The information is used by public agencies, the environmental conservation community, developers, and others to aid in land-use decisions. Our data are essential for prioritizing those species and communities in need of protection and for guiding land-use and land-management decisions where these species and communities exist.

In 1990, NY Natural Heritage published *Ecological Communities of New York State* (Reschke 1990), an all inclusive classification of natural and human-influenced communities. From 50,000-acre beech-maple mesic forests to 40-acre beech maritime forests, sea-level salt marshes to alpine meadows, our classification quickly became the primary source for natural community classification in New York and a fundamental reference for natural community classifications in the northeastern United States and southeastern Canada. This classification, which has been continually updated as we gather new field data, has also been incorporated into the National Vegetation Classification (Grossman *et al.* 1998, Sneddon *et al.* 1998) that is being developed and refined by NatureServe, The Nature Conservancy, and Natural Heritage Programs throughout the United States (including New York).

NY Natural Heritage is an active participant in NatureServe – the international network of biodiversity data centers. There are currently Natural Heritage Programs in all 50 states and 21 Conservation Data Centers (the international equivalent of Natural Heritage Programs) in Canada, Latin America, and South America. These programs work with NatureServe to develop biodiversity data, maintain compatible standards for data management, and provide information about rare species and natural communities that is consistent across many geographic scales – from ¼-wetland sites to the North American continent.

The Nature Conservancy-New York Natural Heritage Program is intimately familiar with the sampling methods and vegetation mapping standards developed for the National Vegetation Classification by the U.S. Geological Survey and adopted by the National Park Service. We were key partners in the recently completed Fire Island National Seashore Vegetation Mapping Project (Klopfer 2001). The Fire Island project made it clear to us that it would be more cost-effective for us to provide the products and expertise for all phases of the project instead of dividing responsibility across several partners. We can do this because (1) we have a profound understanding of the National Vegetation Classification (we helped build it), (2) we have extensive experience with the field sampling methodologies (Edinger *et al.* 2000), and (3) we have the in-house GIS capabilities needed for this project.

In addition to our work on the Fire Island vegetation mapping project, NY Natural Heritage has nearly completed intensive biological inventories of all of New York's State Parks. In this multi-year effort, we are conducting thorough surveys for rare plants and rare animals, gathering detailed information on significant natural communities, and developing seamless vegetation maps of all ecological community

types. To date, we have completed our assessment of more than 280,000 acres in more than 150 state parks across New York. The products of these inventories are proving invaluable to land managers who are seeking to balance myriad land uses. Prior to the State Parks project, we completed similar inventories of all of New York State's Wildlife Management Areas.

In the course of a wide variety of other projects since our inception 17 years ago, we have conducted inventories at the Gateway National Recreation Area and other National Park Service lands for rare plants, rare animals, and significant natural communities. For example, the low salt marshes at Gateway National Recreation Area were assessed by NY Natural Heritage biologists and cooperators as part of a Long Island-wide search for exemplary reference wetlands (MacDonald and Edinger 2000). NY Natural Heritage staff worked closely with National Park Service staff who provided boat transportation for this survey. While these studies provide good baseline information about selected portions of National Park Service lands, they are only part of the whole picture that would be included with seamless vegetation maps.

In addition to generating seamless maps of all ecological communities at each National Park Service site, we will also highlight significant natural communities that are present. Significant natural communities include both rare communities and the best examples of common communities. For example, at the Fire Island National Seashore, NY Natural Heritage documented extremely rare communities such as the maritime oak-holly forest which only occurs in low areas on the back portions of maritime dunes, and the best examples of common communities, such as maritime beach. In the Hudson Valley, we have documented extremely rare communities such as the dwarf pine ridges in the Shawangunk Mountains and several state-rare freshwater tidal communities along the Hudson River, as well as the best example of a more common community, chestnut oak forest, in the Hudson Highlands. These communities merit particular attention from land managers because they represent some of New York's and the nation's most imperiled ecosystems. NY Natural Heritage incorporates detailed information on significant natural communities into its Biological and Conservation Data System to ensure that critical information is readily available to land managers and planners.

METHODS

The Nature Conservancy-New York Natural Heritage Program will administer all aspects of this project; for work in the New Jersey portions of the Gateway National Recreation Area, we will collaborate with the New Jersey Natural Heritage Program. NY Natural Heritage will complete the following tasks:

1. **Conduct site reconnaissance visits and meet with Service staff.**
 - NY Natural Heritage will meet with Service staff from each National Park Service site to explain the project's scope and purpose, to learn security requirements and access logistics, and to gather available site information.
 - Reconnaissance tours of each site will be undertaken to familiarize our staff with broad ecological patterns and to determine field survey logistics.
2. **Compile and assess background data to make preliminary predictions of natural community polygons and National Vegetation Classification associations.**
 - Existing unprocessed information in NY Natural Heritage files will be reviewed and entered into the NY Natural Heritage database for all National Park Service properties in New York. Information on leads for significant natural community occurrences will be reviewed and prioritized for inventory. This information will help us ensure that rare natural community types (which may or may not have distinctive photo signatures) are captured and that exemplary occurrences of common types are highlighted.
 - Digital ortho-corrected aerial photos supplied by the National Park Service will be assessed to make preliminary identifications of natural community polygons and National Vegetation Classification associations at each National Park Service site. Available data layers in digital and

hard copy formats will be reviewed to refine these predictions: soil maps (USDA Soil Conservation Service County Soil Surveys; NY State Soil Survey Geographic Database), bedrock and surficial geology maps (NY State Geological Survey maps and digital data), wetland maps (National Wetlands Inventory Data for NY State; NY State Regulatory Freshwater Wetland data), the NY Natural Heritage database, 1995 NAAP CIR aerial photos, and 1994-99 digital ortho-corrected quarter-quadrangles (DOQQ). Other data layers will be reviewed depending on availability and applicability to the study area, such as tidal wetland maps (NY Department of State, Division of Coastal Resources) and The Nature Conservancy's ecological landscape units.

3. Develop preliminary digital maps of National Vegetation Classification associations.

- Preliminary vegetation maps will be produced by first delineating preliminary polygons on aerial photos supplied by the National Park Service and color infrared National Aerial Photography Program photos using a stereoscope and mylar overlays. Minimum vegetation mapping units will be 0.5 ha, except for unique vegetation types that occur only in small patches (fens, vernal pools, etc.).
- The mylar overlays will be screen digitized in ArcView using digital ortho-corrected aerial photos supplied by the National Park Service to generate preliminary digital maps of National Vegetation Classification associations at each National Park Service site. The screen digitizing process will allow the simultaneous use of aerial photography and supplemental digital data layers that are useful in delineating National Vegetation Classification association boundaries, including USGS quadrangle maps, Department of Transportation road coverages, hydrology coverages, and National Park Service boundaries. All polygons will be attributed with a code at the time of digitizing.
- Preliminary vegetation maps will be made for both National Park Service sites and for surrounding areas defined by the National Park Service (Nigel Shaw, pers. comm. May 1 & 2, 2002).

4. Produce draft vegetation classifications for each site (combining sites where appropriate).

- NY Natural Heritage will produce a draft classification of National Vegetation Classification associations predicted to be at each National Park Service site.
- A draft subset of the New York ecological communities predicted at each National Park Service site will also be produced using the current NY Natural Heritage classification (Edinger *et al.* 2002). Potentially significant ecological communities will be highlighted.

5. Collect plot and observation point data to confirm or correct identification and delineation of National Vegetation Classification associations and significant ecological communities at each site.

- Field methods will be consistent with USGS/NPS Vegetation Mapping Program standards. All plot and observation point data will be used to ensure accurate identification and delineation of community occurrences. Plots and observation points will be recorded using GPS.
- Plots will be sampled following established standards adopted by NY Natural Heritage, the international network of Natural Heritage Programs, and the USGS/NPS Vegetation Mapping Program (Edinger *et al.* 2000, Grossman *et al.* 1998, Sneddon 1994). Plot size will be determined by physiognomic type as follows: forests 200-500 m² (e.g., 20 m x 20 m), shrubland 50-200 m², grassland 50-100 m², dwarf-shrub heath 10-25 m² (Mueller-Dumbois and Ellenburg 1974). Minimally, one plot will be sampled for all natural community occurrences determined to be significant by NY Natural Heritage. Plots will also be sampled in cases where type classification is problematic. Sampled plots will include exhaustive data on plant species composition and structure for all vegetative strata; sampling and noting important soil properties observed within the community; and recording detailed information on surficial and bedrock geology, slope, aspect, elevation, and hydrologic regimes for the area.

- Extensive observation point data will be collected to verify the identity and spatial extent of all associations present at each site. Observation points include data on dominant plant species composition and structure for all vegetative strata. Additional data will be collected as needed to classify the association accurately (e.g., soil type, hydrology, pH, etc.).
 - For significant occurrences, information on the maturity of the occurrence, anthropogenic and natural disturbances influencing the community, and the condition of the surrounding landscape will also be recorded. Combined with the detailed information on the biological and physical properties of the community, data documenting landscape condition will allow a complete assessment of the ecological quality of the community occurrence. The collection of a consistent set of data on each community allows quick and accurate comparisons between communities of the same type, which ultimately determines the overall quality rank of the occurrence.
- 6. Enter data into the NY Natural Heritage Field Forms Database and Biological and Conservation Data System.**
- Plot data will be entered into the NY Natural Heritage Field Forms Database, a database system on a Microsoft Access platform that greatly speeds the preparation of site forms and can easily be transferred into the USGS/NPS Vegetation Mapping Program Plots Database (1997). Species will be assigned standardized codes and names based on the PLANTS database (developed by National Resources Conservation Service in cooperation with the Biota of North America Program).
 - Information on significant natural communities will be incorporated into the NY Natural Heritage Biological and Conservation Data System. This data will become part of the NY Natural Heritage database, and as such will be available for national assessments by the National Park Service in collaboration with NatureServe, and for local assessments by Service land managers and planners.
- 7. Perform statistical analyses of plot data as needed to ensure accurate classification of types encountered.**
- Species and plot data will be formatted into an Excel spreadsheet for use in the PC-ORD version 4.0 Multivariate Analysis package (McCune and Mefford 1999). Statistical analyses will help clarify classification issues, and may utilize Detrended Correspondence Analysis (Hill and Gauch 1980), Two-Way Indicator Species Analysis (Hill 1979), and Non-metric Multidimensional Scaling (Kruskal and Wish 1978, Clarke 1993). Detrended Correspondence Analysis ordines both species and samples simultaneously along perceived gradients (e.g., that may indicate moisture gradient, elevation, etc.). Two-Way Indicator Species Analysis successively divides the plots into groups that are similar in species composition. Non-metric Multidimensional Scaling is an ordination well suited to non-heterogenous, non-normal data sets.
- 8. Produce final classifications for each site (combining sites where appropriate).**
- NY Natural Heritage will refine the draft classification of National Vegetation Classification associations at each National Park Service site based on field assessments and statistical analyses.
 - A refined subset of the New York ecological communities predicted at each National Park Service site will also be produced using the current NY Natural Heritage classification (Edinger *et al.* 2002). Significant ecological communities will be highlighted.
- 9. Produce final vegetation maps for each site (combining sites where appropriate).**
- The preliminary draft vegetation maps will be finalized based on field assessments and statistical analyses. When significant natural community polygons extend beyond National Park Service property boundaries, NY Natural Heritage will use aerial photo interpretation to digitize each occurrence's full extent.
 - The attribute table for each polygon will then be automatically populated with area (m²), perimeter (m), and total acres data using an ArcView script. As a final step, the ArcView shapefile

will be converted to an ArcInfo polygon coverage through the use of the SHAPEARC and REGIONPOLY commands in ArcInfo. The final digital product for each National Park Service site will include a shapefile, an ArcInfo polygon coverage, and a DBF file containing information on each National Vegetation Classification association.

10. Conduct accuracy assessment of vegetation maps

- After the final vegetation map has been completed, NY Natural Heritage will carry out an assessment of class and positional accuracy across each National Park Service site. We will first develop a random sampling scheme for accuracy assessment observation points, stratified by polygon/vegetation type. The number of required accuracy assessment sampling points will be based on USGS/NPS Vegetation Mapping Program protocols. We will then survey accuracy assessment observation points to determine the association and natural community type present. Results of the accuracy assessment may be used to make minor corrections to the final vegetation maps.

11. Complete final project report.

- NY Natural Heritage will deliver final reports on each National Park Service site (or combination of sites) that includes: concise methods summary; lists and descriptions of National Vegetation Classification associations and NY Natural Heritage ecological community types; and site descriptions of significant natural communities. Paper maps of National Vegetation Classification associations and significant ecological communities will be included as appendices. All polygons, attribute tables, and metadata will be delivered on CD in ArcView 3.2 format or other ArcInfo format acceptable to the Service and in a projection compatible for Service needs, as will vegetation data entered into the USGS/NPS Vegetation Mapping Program Plots Database. GPS locations of all sample plots and observation points, including accuracy assessment points, will be provided as part of the attribute files. Field plot data will be provided in the into USGS/NPS Vegetation Mapping Program Plots Database.
- All digital geospatial data developed for this project will have Federal Geographic Data Committee (FGDC) compliant metadata in digital form. The metadata will be parsed using the metadata parser provided by the FGDC (<http://www.fgdc.gov>) or the FGDC Metadata Editor in ESRI ArcGIS software. The metadata will be supplied as ASCII text with a .txt extension, hypertext markup language with a .html extension, and standard general markup language with a .sgml extension.
- Data collected during this study will also be integrated into the NY Natural Heritage database, and may be used in the future to refine the National Vegetation Classification and the New York ecological community classification.

SCHEDULE & DELIVERABLES

This is a fixed-price contract. Deliverables and invoices will be delivered as follows:

July - December 2002

Tasks 1-4: conduct reconnaissance visits, compile background data, make preliminary predictions of associations, and develop preliminary digital maps and classifications
 December 31, 2002 Submit preliminary digital maps and draft classifications for each National Park Service site, and submit invoice for \$27,418

January - June 2003

Task 5: begin collecting plot and observation point data
 June 30, 2003 Submit brief progress report on field survey results, and submit invoice for \$19,000

July - December 2003

Tasks 5-7: finish collecting plot and observation point data, enter data, and perform statistical analyses
 December 31, 2003 Submit brief progress report on significant natural communities and results of statistical analysis of plot data, and submit invoice for \$19,000

January - June 2004

Tasks 8-11: produce final classifications and maps, conduct accuracy assessment, and complete final reports for each National Park Service site
 June 30, 2004 Submit final reports for each National Park Service site, and submit invoice for \$19,000

BUDGET (For Negotiating Purposes Only)

Personnel	\$48,750	Salary and 37% Benefits
Travel	\$ 3,400	Includes vehicle travel, room, and board
Supplies	\$ 1,500	
Equipment	\$ 6,900	Computer
Other	\$ 3,645	Includes telecommunications, printing & photo, etc.
<u>Contractor</u>	<u>\$ 5,000</u>	Participation by New Jersey Natural Heritage Program
Direct Costs	\$69,195	
<u>Indirect Costs</u>	<u>\$15,223</u>	The Nature Conservancy's 22% federally approved rate
Project Total	\$84,418	

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